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AN INTERESTING CASE OF NATURAL SELECTION.

SAMUEL F. CLARKE.

IN the early part of last spring I obtained a large number of the gelatinous egg-masses of one of our native salamanders or newts (probably *Amblystoma opacum*). They had been deposited in a small pond of clear water, in the edge of a wood just outside the city.

These egg-masses, or bunches of eggs, vary greatly in size, the smallest being no larger than an English walnut and containing only from five to eight eggs, while the largest bunches are from six to eight inches long, more or less oval in shape, and contain from one hundred and fifty to two hundred eggs. The bunches are usually attached to some water-plant or to an overhanging blade of grass, and the gelatinous matter is so translucent that the dark, opaque eggs may readily be seen through it. Each egg is surrounded by two membranes, between which there is quite a space; and as this space, as well as that within the inner membrane, is filled with fluid, an admirable arrangement is thus secured for protecting the embryos from any injury to which they might be exposed by coming in contact with any hard, unyielding body.

The eggs were kept in large glass jars and developed quite rapidly, the rate of growth seeming to depend upon the purity and temperature of the water. After their gills and balancers were developed, they emerged from the eggs and began their active life in the water. And now I found trouble in keeping them, for I was unable to find what they wanted for food. I tried various things but did not succeed in pleasing them. Upon watching them closely I soon found that they had developed cannibalistic tendencies and were eating off one another's gills. This led me to study their movements still more closely, when I soon discovered that among the many there were a few, who although they came from the same parents and were subjected to the same conditions while in the egg, were yet gifted with greater vigor and energy than most of their brothers and sisters or cousins. These few stronger ones eat off the gills of many of the weaker ones and at the same time were enabled to protect their own from mutilation or destruction.

These favorable conditions, the large supply of food and the better aeration of the blood, soon began to show their influence upon the growth of the individuals thus favored. Within a week

or ten days from the escape from the egg, these favored few were fifty per cent. larger than their weaker comrades who were born upon the same day. Their mouths had by this time increased so much in size that they were no longer satisfied with nibbling off the gills of their brethren, but now began to swallow them bodily. This great increase in the supply of food soon produced a marked effect upon those who were thus supplied; so that in ten days from the time that they began to feed in this way they were from ten to twelve times the length and bulk of those upon whom they were feeding. Developing at this rapid rate, they arrived at the stage when the gills are re-sorbed and the abbranchiate form leaves the water for the marshy land or old, damp log, where it usually makes its home and where it would find a supply of more natural food-material.

Here then was a very interesting case of natural selection, by survival of the fittest. All the weaker individuals being destroyed and actually aiding the stronger ones by serving them as food until they could pass through their changes and escape to other regions where food was more abundant.

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RECENT LITERATURE.

FLÖGEL ON THE STRUCTURE OF THE BRAIN IN DIFFERENT ORDERS OF INSECTS.—The Supplementary Heft for May 28th of Siebold and Kölliker's *Zeitschrift für Wissenschaftliche Zoologie* contains an elaborate article by J. H. L. Flögel, illustrated by a number of micro-photographs. This and Dietl's excellent paper, published in 1876, are the only treatises on the minute structure of the brain of insects, Owsikianikof having studied that of the spiny lobster (*Palinurus*) several years ago, while Dietl studied the brain of *Astacus*. Flögel establishes three points as the results of his researches.

First, the constant presence of the remarkable central body in the mature insects of all orders, while it is almost absent in the larvæ of *Lepidoptera* (but not in *Hymenopterous* larvæ). We are thus led to suppose that it has something to do with the formation of the faceted eyes. If it has any relation with the bundle of fibres passing from the optic lobe, there is nothing to indicate it.

Secondly, the size of the olfactory lobe, with its olfactory bodies, correlated in insects with small antennæ entirely unfit for tasting, but on the contrary with a very completely developed sense of smell, is in the author's opinion an excellent proof of the correctness of Leydig's view that the antennæ are organs of smell, whatever may be brought forward in opposition to it. If they are to be interpreted as an apparatus for detecting sounds,